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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/889,508	10/18/2001	Masaou Matsuda	358362010400	5230

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EXAMINER

BOYD, JENNIFER A

ART UNIT	PAPER NUMBER
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1771

DATE MAILED: 06/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 09/889,508	Applicant(s) MATSUDA ET AL.	
	Examiner Jennifer A Boyd	Art Unit 1771	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 08 April 2004.  
 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.  
 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-4 and 6-11 is/are pending in the application.  
     4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
 6) ☒ Claim(s) 1-4 and 6-11 is/are rejected.  
 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.  
 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☒ All    b) ☐ Some \*    c) ☐ None of:  
         1. ☐ Certified copies of the priority documents have been received.  
         2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
         3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Amendment***

1. The Applicant's Amendments and Accompanying Remarks, filed April 8, 2004, have been entered and have been carefully considered. Claims 1 and 10 are amended, claim 5 is cancelled and claims 1 – 4 and 6 – 11 are pending. In view of Applicant's Amendments, the Examiner withdraws the 35 U.S.C. 112, 2<sup>nd</sup> paragraph rejection of claims 1 - 11 as set forth in paragraph 4 of the previous Office Action dated June 26, 2003. In view of Applicant's Amendments, the Examiner withdraws the rejection as set forth in paragraphs 4 and 5 of the previous Office Action dated January 8, 2004. Despite these advances, the invention as currently claimed is not found to be patentable for reasons herein below.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

### ***Claim Rejections - 35 USC § 103***

3. Claims 1 – 4, 6 and 8 rejected under 35 U.S.C. 103(a) as being unpatentable over Endo (US 4,157,436).

Endo is directed to a phosphorus-containing polyester (Title).

As to claim 1, Endo teaches a flame retardant polyester having a phosphorus atom content of 500 – 50,000 ppm (Abstract). Endo teaches that the flame retardant polyester can be spun into filaments and yarn (Example 10, column 23, lines 30 – 35). In Example 10, Endo teaches that the fiber is melt-spun at a spinning speed of 600 m/min (column 23, lines 24 – 30).

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In regards to Applicant's limitation that the phosphorus atom is in a side chain, it should be noted that the general formula of the phosphorus-containing compound of Endo as seen in column 2, lines 25 – 35 is exactly the same as the general formula found in Applicant's claim 2 and on page 11 of the Applicant's Specification. Therefore, is it the position of the Examiner that the "side chain" limitation has been met by Endo.

As to claim 2, Endo teaches that the flame retardant polyester with a general formula as seen in the Abstract. Endo teaches that the compound has a  $-\text{CH}_2-$  linkage which is equated to Applicant's A which a divalent or trivalent organic residue. Endo teaches that  $\text{R}_2$  and  $\text{R}_3$  are selected from a halogen atom and a hydrocarbon group having 1 to 10 carbon atoms as seen in the general formula and Abstract, equated to Applicant's  $\text{R}_2$  and  $\text{R}_3$ . Endo teaches that the compound has a  $\text{R}_1$  is an ester-forming functional group which is equated to Applicant's  $\text{R}_1$ . Endo teaches that  $n_1$  can be 1 or 2 and  $n_2$  and  $n_3$  can have an integer of 0 – 4 (Abstract). It should be noted that various examples of the phosphorous compounds found in Endo are also found in the Applicant's Specification. For Example, Endo teaches an example labeled as (a) on column 4, lines 30 – 40 which is the same as example (a) of the Applicant on page 11.

As to claim 8, Endo teaches that the flame retardant polyester can be spun into filaments and yarns and knitted into a tricot (column 23, lines 7 – 34), which is known in the art to be a warp knitted fabric.

As to claim 1, Endo fails to teach that the flame-retardant polyester fiber can be product by melt-spinning at a take-up speed of 1,000 m/min – 4,500 m/min. It should be noted that take-up speed is a result effective variable. For example, as the take-up speed increases, the fiber

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production increases and resultant fiber diameter can be decreased. It should be noted that one major factor in the upper limit of take-up speed depends on the speed at which fiber breakages occurs. It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the flame retardant polyester fiber at a take-up speed of 1,000 – 4,500 m/min, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). In the present invention, one would have been motivated to update the spinning speed of Endo to reflect current technology of higher spinning speed capacities in order to improve production.

As to claims 1, 3 – 4 and 6, although Endo does not explicitly teach the claimed properties detailed by the following formulas:  $\tan \delta_{\max} \geq 0.1740$ ,  $T\alpha - 3.77 \times \ln(\text{dtpf}) \leq 137.0$  and  $1.331 \leq SG - \sqrt{\Delta n}/8.64 \leq 1.345$  as required by claim 1, a property of having not less than 6500 times up to an occurrence of cutting by abrasion under a load of 0.098 N/tex in a yarn abrasion test as required by claim 3, a tensile elongation to break (DE) of 20 – 50% as required by claim 4, a shrinkage in hot water (SHW) of not more than 10% as required by claim 1, the polyester meets the requirements of formulas 4 – 5 as required by claim 6, it is reasonable to presume that the properties detailed by the following formulas:  $\tan \delta_{\max} \geq 0.1740$ ,  $T\alpha - 3.77 \times \ln(\text{dtpf}) \leq 137.0$  and  $1.331 \leq SG - \sqrt{\Delta n}/8.64 \leq 1.345$  as required by claim 1, a property of having not less than 6500 times up to an occurrence of cutting by abrasion under a load of 0.098 N/tex in a yarn abrasion test as required by claim 3, a tensile elongation to break (DE) of 20 – 50% as required by claim 4, a shrinkage in hot water (SHW) of not more than 10% as required by claim 1, the

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polyester meets the requirements of formulas 4 – 5 as required by claim 6 is inherent to Endo. Support for said presumption is found in the use of like materials (i.e. a phosphorous-containing polyester fiber) which would result in the claimed property. The burden is upon the Applicant to prove otherwise. *In re Fitzgerald* 205 USPQ 594. In addition, the presently claimed properties detailed by the following formulas:  $\tan \delta_{\max} \geq 0.1740$ ,  $T\alpha - 3.77 \times \ln(\text{dtpf}) \leq 137.0$  and  $1.331 \leq \text{SG} - \sqrt{\Delta n}/8.64 \leq 1.345$  as required by claim 1, a property of having not less than 6500 times up to an occurrence of cutting by abrasion under a load of 0.098 N/tex in a yarn abrasion test as required by claim 3, a tensile elongation to break (DE) of 20 – 50% as required by claim 4, a shrinkage in hot water (SHW) of not more than 10% as required by claim 1, the polyester meets the requirements of formulas 4 – 5 as required by claim 6 would obviously have been present once the Endo product is provided. Note *In re Best*, 195 USPQ at 433, footnote 4 (CCPA 1977). It should be noted that at this time the Examiner cannot search fiber fineness and density requirements because the values of those parameters are represent format in which they are dependent on inherent values.

4. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Endo (US 4,157,436) in view of Buxbaum (US 4,101,526).

Endo teaches that a catalyst comprising a compound of metals such as antimony, germanium, titanium, etc. may be used to obtain the polyester (column 12, lines 1 – 10) and that various additives may be included such as pigments (column 12, lines 30 – 40).

Endo fails to teach the specific use of an organic fluorescent brightener in a proportion of 0.01 – 1 wt % and, as a condensation polymerization catalyst, the specific *combination of* an

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antimony compound, a germanium compound and a cobalt compound in the amounts that simultaneously satisfy formulas 6- 9 in claim 7.

Buxbaum is directed to a process for manufacturing a linear polyester containing phosphates suitable for use in the form of a filament (Abstract and column 7, lines 50 – 60). Buxbaum teaches that metal compound mixtures comprising cobalt, germanium and antimony can be employed in the polyester in the amount of 0.001 to 1% by weight (column 6, lines 14 – 20). Buxbaum teaches that other additives can be included such as fluorescent whitening agents (column 7, lines 5 – 15).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to include an organic fluorescent brightener as suggested by Buxbaum in the polyester of Endo motivated by the desire to create a properly whitened polyester to achieve maximal dyeing color uptake and color integrity.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a catalyst comprising antimony, germanium and cobalt as suggested by Buxbaum in the polyester of Endo motivated by the desire to create a high polymerization rate.

Buxbaum discloses the claimed invention except for the level of fluorescent brightener present in the polymer is 0.01 – 1% by weight and that the amount of antimony, germanium and cobalt compounds satisfy the following equations:  $30 \leq S \leq 400$ ,  $10 \leq G \leq 100$ ,  $5 \leq C \leq 40$  and  $200 \leq S + 2G + C \leq 400$ . It should be noted that the amount of fluorescent brightener, antimony, germanium and cobalt compounds are result effective variables. For example, as the amount of brightener increases, the polymer becomes whiter and brighter. When the amount of the

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antimony compound added is less than the aforementioned range, the condensation polymerization becomes slow, and when it exceeds the above-mentioned range, the L value as measured with a Hunter's color-difference meter unpreferably decreases. When the amount added of the germanium compound is less than the above-mentioned range, the condensation polymerization becomes slow, and when it exceeds the above-mentioned range, the production cost becomes higher because germanium is extremely expensive, and the b value of the polymer unpreferably increases. When the amount added of the cobalt compound is less than the above-mentioned range, the b value of the color tone of the resulting polymer becomes high. It would have been obvious to one having ordinary skill in the art at the time the invention was made to add the fluorescent brightener in the amount of 0.01 – 1% by weight since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). In the present invention, one would have been motivated to optimize the amount of optical brightener to create a suitably white polyester and to optimize the levels of antimony, germanium and cobalt to create a cost efficient, properly tinted polyester which is polymerized in an efficient manner.

5. Claims 9 – 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Endo (US 4,157,436) in view of Vogt (US 5,952,413).

Endo teaches that the polyester of the invention can be knitted into a tricot (column 23, lines 30 – 35), which is known in the art to be a warp knitted fabric.



Endo fails to teach that the knitted fabric has undergone a raising treatment to create a sueded fabric as required by claims 9 and 10. Endo fails to teach that the fiber can be made into a nonwoven fabric as required by claim 11.

Vogt teaches a method of making a polyurethane suede-like material (Title). Vogt teaches that the textile fabric can comprise any synthetic fiber such as polyester (column 4, lines 45 – 48). Additionally, the fabric may be in any form such as woven, non-woven or knitted (column 4, lines 53 – 55).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a raising treatment to create a sueded fabric as suggested by Vogt in the application of Endo motivated by the desire to have an aesthetically pleasing and soft material.

It would have been obvious to one of ordinary skill in the art at time the invention was made to create a nonwoven fabric as suggested by Vogt with the polyester of Endo to expand the number of applications for the fabric.

Although Endo in view of Vogt does not explicitly teach the claimed coefficient of friction of a surface of 0.200 – 0.300 as required by claim 9 and after-flame time of not more than 3 seconds as measured by the Applicant's test as required by claim 10, it is reasonable to presume that the claimed coefficient of friction of a surface of 0.200 – 0.300 as required by claim 9 and after-flame time of not more than 3 seconds as measured by the Applicant's test as required by claim 10 is inherent to Endo in view of Vogt Support for said presumption is found in the use of like materials (i.e. phosphorus-containing polyester knitted or non-woven fabric with a sueded surface) which would result in the claimed property. The burden is upon the Applicant to prove otherwise. *In re Fitzgerald* 205 USPQ 594. In addition, the presently claimed

property of the claimed coefficient of friction of a surface of 0.200 – 0.300 as required by claim 9 and after-flame time of not more than 3 seconds as measured by the Applicant's test as required by claim 10 would obviously have been present once the Endo in view of Vogt product is provided. Note *In re Best*, 195 USPQ at 433, footnote 4 (CCPA 1977).

### ***Response to Arguments***

6. Applicant's arguments filed April 8, 2004 have been fully considered but they are not persuasive.

7. In response to Applicant's Argument that Endo is a main chain type copolymerized polyester, the Examiner respectfully argues the contrary. First, Endo never explicitly states that the phosphorus compound is present in the main chain. If the Examiner has overlooked such a disclosure, it is suggested that the Applicant direct the Examiner's attention to a specific column and line in Endo. Therefore, the Examiner must resort to relying on the compound formulas found in columns 4 – 8 of Endo to compare to the present invention. It should be noted that the general formula of the phosphorus-containing compound of Endo as seen in column 2, lines 25 – 35 is exactly the same as the general formula found in Applicant's claim 2 and on page 11 of the Applicant's Specification. Therefore, is it the position of the Examiner that the "side chain" limitation has been met by Endo. If these embodiments do not show Applicant's "phosphorus atom in a side chain", the Examiner submits that the Applicant has failed to submit a drawing or figure showing the preferred and claimed embodiment as required by 37 CFR 1.83(a) which states that the drawings must show every feature of the invention specified in the claims.

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Therefore, if a "side chain" is not shown, the "side chain" must be shown or the feature(s) canceled from the claim(s).

8. In response to Applicant's Argument concerning the rejection as being unpatentable over Buxbaum, the Examiner respectfully argues the contrary. See the arguments in the paragraph 6 above. Endo meets all limitations of claim 1 and therefore, the rejection of Endo in view of Buxbaum which appears in paragraph 3 of this Office Action is considered valid.

### ***Conclusion***

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

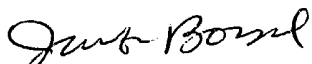
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer A Boyd whose telephone number is 571-272-1473. The examiner can normally be reached on Monday thru Friday (8:30am - 6:00pm).


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrel Morris can be reached on 571-272-1478. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Jennifer Boyd

June 18, 2004

  
**Ula C. Ruddock**  
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Tech Center 1700